



Client Enrichment Series

Welcome to today's presentation on:

Introduction to Sustainability

the presentation will start at 2:00 PM EST

Note: Phones are automatically muted during the presentation. You have the ability to send questions to the host and presenters through your questions pane. They will answer as many of the questions as possible throughout and at the end of the presentation. All questions will be captured, and answers sent to all participants within a few weeks.



Client Enrichment Series

Introduction to Sustainability

Hosted by: Leah Fant, National Account Manager, GSA Central Office



Presented by: Thomas Burke, NEPA & Sustainability Coordinator, Energy & Sustainability Branch



Sustainability



What is Sustainability?

- Energy Efficiency
- Water Efficiency
- Recycling
- Waste Prevention
- Green Cleaning
- Indoor Air Quality
- Green Purchasing
- Waterless Urinals
- Low Flow Toilets
- Transportation
- Zero Environmental Footprint
- USGBC, LEED
- Carbon Footprint
- Green Buildings
- Net Zero Energy
- Green Roofs
- Eco Friendly
- Energy Star
- High Performance Buildings
- Green Power: Solar/ Wind
- Renewable power
- Day lighting
- LEDs

Sustainability

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”United Nations 1987

“Sustainable: to create and maintain conditions under which humans and nature can exist in productive harmony that permit fulfilling the social, economic, and other requirements of present and future generations of Americans”E.O. 13423

Impact of Buildings

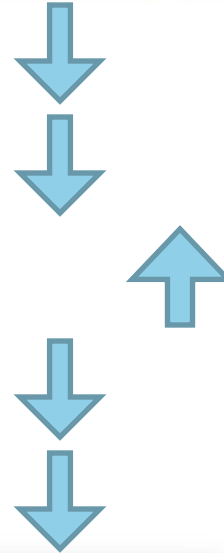
- Electricity 72%
- Total Energy 39%
- Carbon Dioxide 38%
- Raw Materials 40%
- Waste Output 30%
- Water 14%



Green Building Benefits

Average Savings

- Energy Consumption 25%
- Carbon Dioxide 30%
- Occupant Satisfaction 25%
- Maintenance Cost 10%
- Water 30-50%



Regulatory Drivers

- Executive Order 13653 2013
 - Prepare for Impacts of Climate Change
- Executive Order 13514 2009
 - Green House Gases (CO₂)
 - Waste Diversion 50% by 2015
- Executive Order 13423 2007
 - 30% less energy by 2015
 - 16% less water by 2016
- Energy Independence Security Act (EISA) 2007
 - Codifies sections of E.O. 13423



Regulatory Drivers

- Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings 2006
 - Now part of E.O. 13423
 - 15% building & leases by 2015
- Energy Policy Act 2005
 - New Construction 30% less energy than ASHRAE 90-1-2004



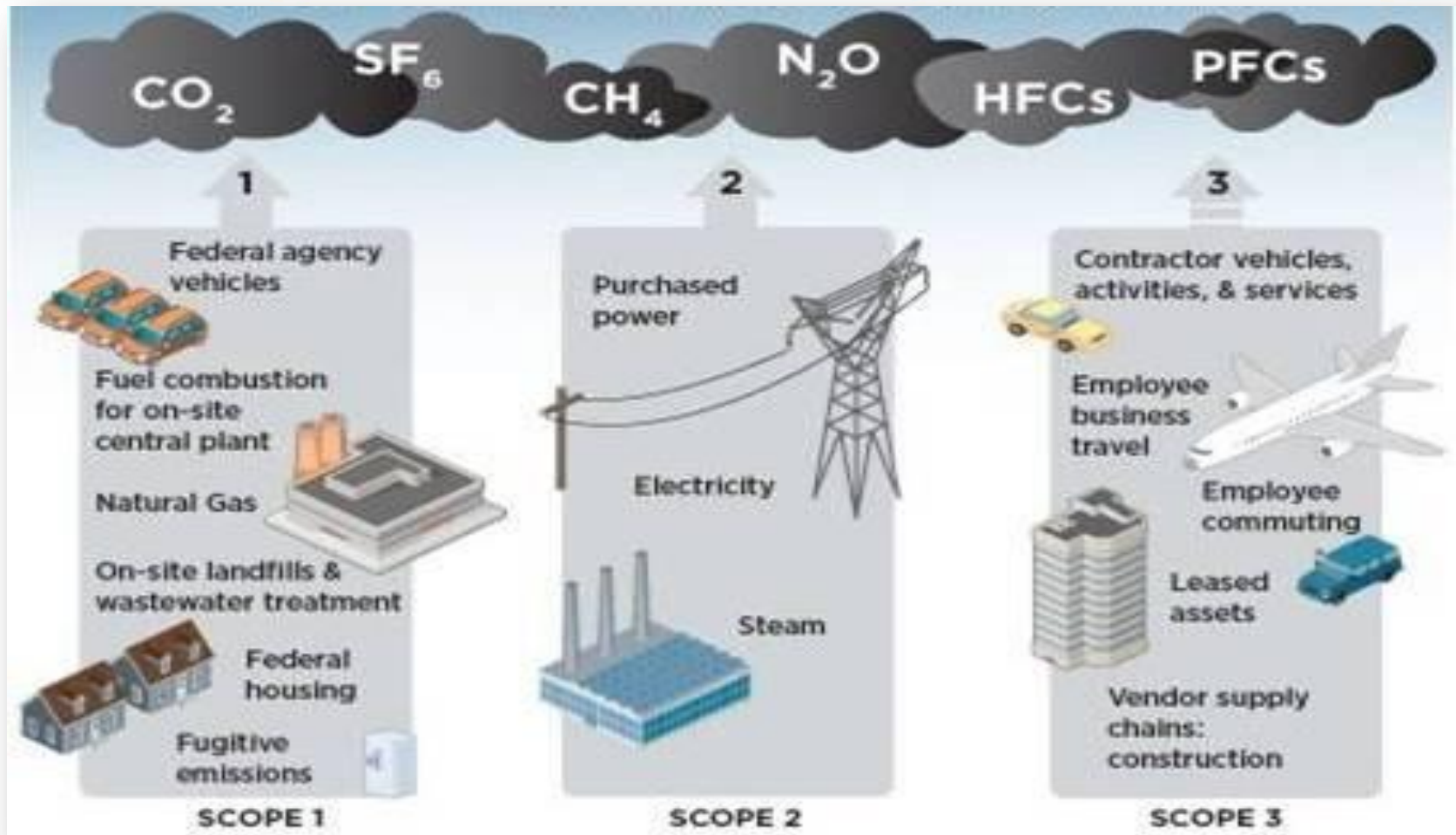
E.O. 13514

“Federal Leadership in Environmental, Energy, and Economic Performance”

Expands sustainability goals of previous laws and
Executive Orders

- Green House Gas Management
- Strategic Sustainability Performance Planning

Common Sources of Federal Greenhouse Gas Emissions



Why Sustainability?

- Executive Orders and Laws
- Each Agency has its own mandated Strategic Sustainability Performance Plan (SSPP)
 - <http://www.whitehouse.gov/administration/eop/ceq/sustainability/plans>
- OMB Scorecards
- Triple Bottom Line, P3
 - People
 - Planet
 - Profit



Energy, Water & Recycling

- Energy reduction 30% by 2015
(based on FY2003 baseline)
- Water reduction by 26% by 2020
(based on FY2007 baseline)
- Waste Diversion 50% by 2015



Recycling & Waste Diversion

- Divert at least 50% of non-hazardous solid waste by the end of FY2015
- Minimize waste and pollutants
 - Reduce
 - Reuse
 - Recycle



Recycle

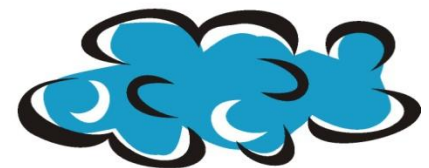
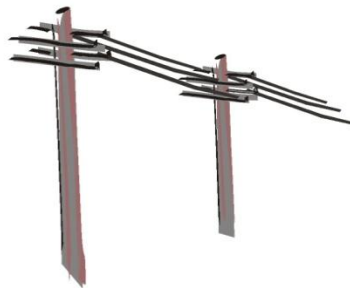
- Glass
- Cardboard
- Paper, Newspaper, Magazines
- Wood
- Plastics
- Aluminum Cans
- Fluorescent Bulbs
- Construction & Demolition Debris
- Electronics





Results of Recycling

- **Savings From Every Ton of Recycled Paper**
 - 7000 gallons of water
 - 17 Trees
 - 4100 KWh
 - 60 pounds of air pollutants



Guiding Principles

Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings



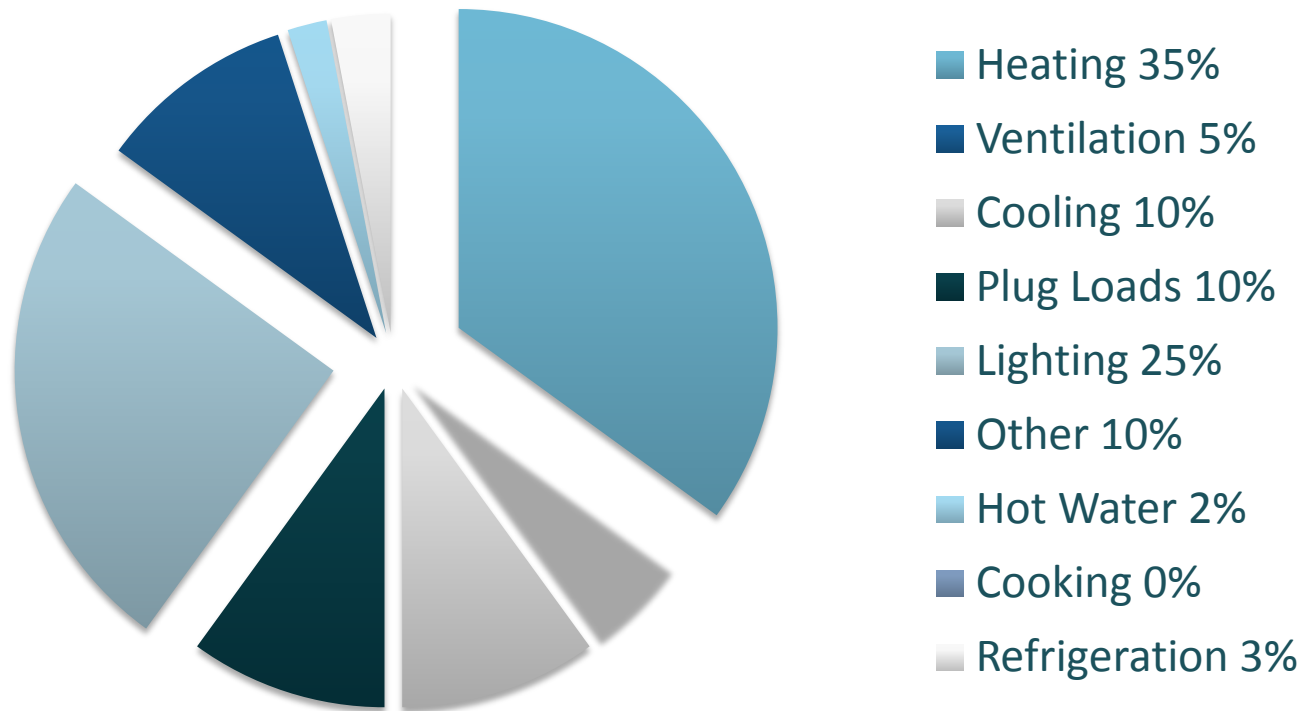
Sustainable Guiding Principles

- Employ Integrated Design Principles
 - Integrated Design, incorporate into building operations and procedures
 - Commissioning within 4 years
- Optimize Energy Performance
 - Energy Star 75, 20% less than 2003 baseline, 20% reduction via ASHARE model
 - On Site Renewable Energy
 - Measurement and Verification through building level utility meters



Energy Distribution by Load Type for an Office Building

- DOE Commercial Building Energy Consumption Survey National Average



Sustainable Guiding Principles

- Protect and Conserve Water
 - Indoor Water, 20% potable water reduction compared to 2003 baseline
 - Outdoor Water, 50% (landscaping) potable water reduction compared to 2003 baseline, or no potable water for irrigation
 - Process Water
 - Water efficient products (Water Sense products)

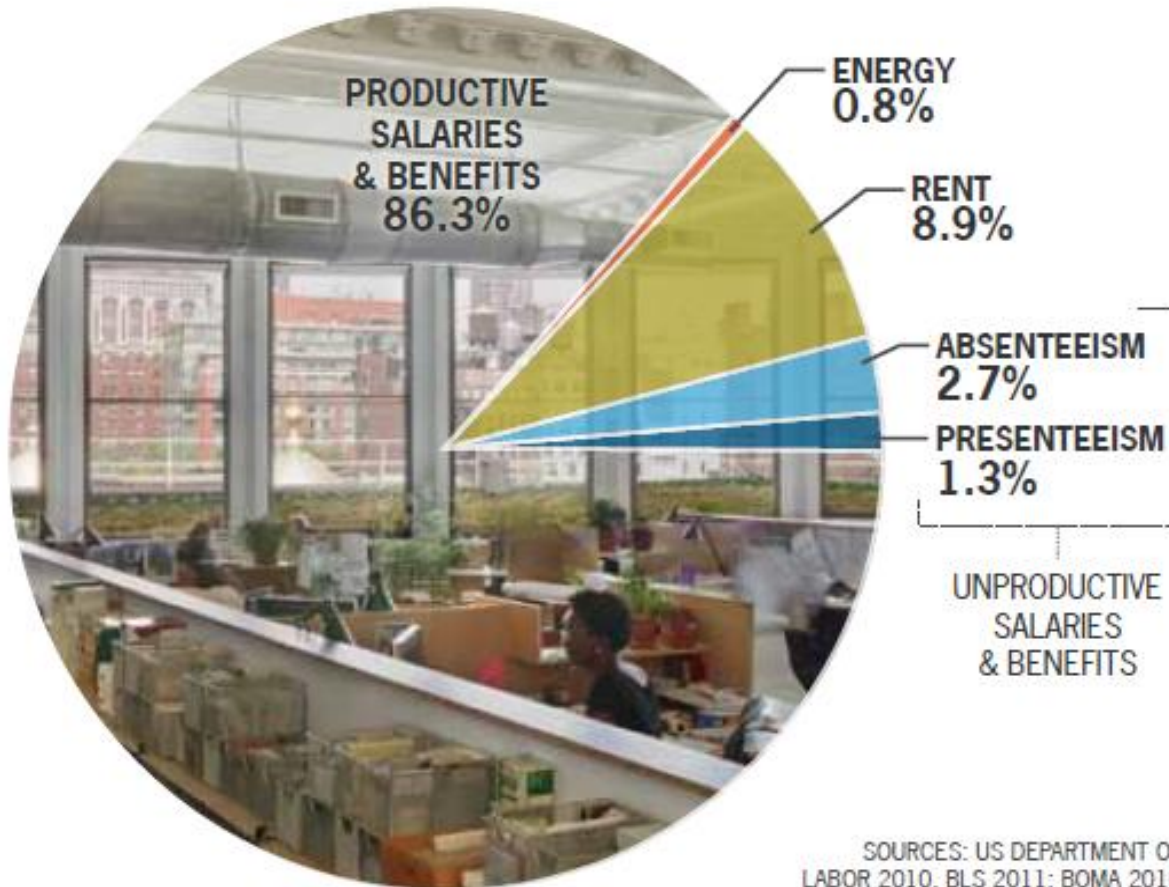


Sustainable Guiding Principles

- Enhance Indoor Environmental Quality
 - Ventilation and Thermal Comfort, ASHRAE
 - Moisture Control
 - Day Lighting, 2% into 50% of spaces or 50% of occupants control lighting, task lighting
 - Low Emitting Materials
 - Protect Indoor Air Quality During Construction
 - Integrated Pest Management
 - Tobacco Smoke Control







Sustainable Guiding Principles

- Reduce Environmental Impacts of Materials

- Environmentally Preferable Products (EPP)
- Recycled Content
- Bio-based Content (USDA)
- Waste & Material Management
- Ozone Depleting Materials, CFCs



Green Lease Clauses

- Compliance with Guiding Principles
- Green Clauses (31-37)
- Option of pursuing LEED Commercial Interiors (CI) Certification
- Energy Star Requirements for new leases



Examples of Lease Clauses for Compliance with Guiding Principles

Sustainable Lease Clause	Sustainability Objective Promoted
Green Lease Submittals	Energy Conservation
Janitorial Services	Env. Friendly Cleaning Products
Existing Fit Out : Salvaged, Reused Building Materials	Re-Use of Materials
Construction Waste Mgmt. – New Construction Only	Recycling of Waste Materials
Indoor Air Quality During Construction	Use of Low Impact Materials
Ceilings	Use of Recycled Content
Landscaping : New Construction Only	Water Consvtn. & Reduced Chem. Use
Recycled Content Products	Use of Recycled Products
Wood Products	Use of Low Impact Materials
Adhesives & Sealants	Avoidance of Highly Toxic Products
Doors : Hardware	Low Impact Materials
Wall Finishes	Low Impact Materials
Painting	Use of Low Impact Materials
Carpet : Broadloom or Tile	Use of Low Impact Materials
Mechanical, Electrical, Plumbing	Use of Energy Efficient Equipment
Energy Cost Savings / Energy Efficiency & Conservation	Encourages Energy Efficiency

LEED

U.S. Green Building Council
(USGBC)



Leadership in
Energy and
Environmental
Design



LEED



- LEED is the USGBC rating system for the design, construction, and operation of high performance buildings
- LEED offers 3rd party validation of your building's green/sustainable features
- The rating system has prerequisites and credits (points)
- Four levels of certification:
 - **Certified**
 - **Silver**
 - **Gold**
 - **Platinum**

LEED

Types of LEED

- Existing Building: Operation and Maintenance - EBOM
- Interior Design & Construction - ID+C (Commercial Interiors)
- Building Design & Construction - BD+C (New Construction)



LEED

- Sustainable Sites (SS)
- Water Efficiency (WE)
- Energy & Atmosphere (EA)
- Materials & Resources (MR)
- Indoor Environmental Quality (IEQ)



LEED 2009 for New Construction and Major Renovations			Project Name _____	
Project Checklist			Date _____	
Sustainable Sites Possible Points: 26			Materials and Resources, Continued	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	Prereq 1	Construction Activity Pollution Prevention	<input type="checkbox"/>	Credit 4
<input type="checkbox"/>	Credit 1	Site Selection	<input type="checkbox"/>	Credit 5
<input type="checkbox"/>	Credit 2	Development Density and Community Connectivity	<input type="checkbox"/>	Credit 6
<input type="checkbox"/>	Credit 3	Brownfield Redevelopment	<input type="checkbox"/>	Credit 7
<input type="checkbox"/>	Credit 4.1	Alternative Transportation—Public Transportation Access		
<input type="checkbox"/>	Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms		
<input type="checkbox"/>	Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles		
<input type="checkbox"/>	Credit 4.4	Alternative Transportation—Parking Capacity		
<input type="checkbox"/>	Credit 5.1	Site Development—Protect or Restore Habitat		
<input type="checkbox"/>	Credit 5.2	Site Development—Maximize Open Space		
<input type="checkbox"/>	Credit 6.1	Stormwater Design—Quantity Control		
<input type="checkbox"/>	Credit 6.2	Stormwater Design—Quality Control		
<input type="checkbox"/>	Credit 7.1	Heat Island Effect—Non-roof		
<input type="checkbox"/>	Credit 7.2	Heat Island Effect—Roof		
<input type="checkbox"/>	Credit 8	Light Pollution Reduction		
Water Efficiency Possible Points: 10			Indoor Environmental Quality Possible Points: 15	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	Prereq 1	Water Use Reduction—20% Reduction	<input type="checkbox"/>	Prereq 1
<input type="checkbox"/>	Credit 1	Water Efficient Landscaping	<input type="checkbox"/>	Prereq 2
<input type="checkbox"/>	Credit 2	Innovative Wastewater Technologies	<input type="checkbox"/>	Credit 1
<input type="checkbox"/>	Credit 3	Water Use Reduction	<input type="checkbox"/>	Credit 2
Energy and Atmosphere Possible Points: 35			<input type="checkbox"/>	Credit 3.1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 3.2
<input checked="" type="checkbox"/>	Prereq 1	Fundamental Commissioning of Building Energy Systems	<input type="checkbox"/>	Credit 4.1
<input type="checkbox"/>	Prereq 2	Minimum Energy Performance	<input type="checkbox"/>	Credit 4.2
<input type="checkbox"/>	Prereq 3	Fundamental Refrigerant Management	<input type="checkbox"/>	Credit 4.3
<input type="checkbox"/>	Credit 1	Optimize Energy Performance	<input type="checkbox"/>	Credit 4.4
<input type="checkbox"/>	Credit 2	On-Site Renewable Energy	<input type="checkbox"/>	Credit 5
<input type="checkbox"/>	Credit 3	Enhanced Commissioning	<input type="checkbox"/>	Credit 6.1
<input type="checkbox"/>	Credit 4	Enhanced Refrigerant Management	<input type="checkbox"/>	Credit 6.2
<input type="checkbox"/>	Credit 5	Measurement and Verification	<input type="checkbox"/>	Credit 7.1
<input type="checkbox"/>	Credit 6	Green Power	<input type="checkbox"/>	Credit 7.2
Materials and Resources Possible Points: 14			<input type="checkbox"/>	Credit 8.1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 8.2
<input checked="" type="checkbox"/>	Prereq 1	Storage and Collection of Recyclables		
<input type="checkbox"/>	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof		
<input type="checkbox"/>	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements		
<input type="checkbox"/>	Credit 2	Construction Waste Management		
<input type="checkbox"/>	Credit 3	Materials Reuse		
Innovation and Design Process Possible Points: 6			Regional Priority Credits Possible Points: 4	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Credit 1.1	Innovation in Design: Specific Title	<input type="checkbox"/>	Credit 1.1
<input type="checkbox"/>	Credit 1.2	Innovation in Design: Specific Title	<input type="checkbox"/>	Credit 1.2
<input type="checkbox"/>	Credit 1.3	Innovation in Design: Specific Title	<input type="checkbox"/>	Credit 1.3
<input type="checkbox"/>	Credit 1.4	Innovation in Design: Specific Title	<input type="checkbox"/>	Credit 1.4
<input type="checkbox"/>	Credit 1.5	Innovation in Design: Specific Title		
<input type="checkbox"/>	Credit 2	LEED Accredited Professional		
Total Possible Points: 110			Regional Priority Credits Possible Points: 4	
Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110			<input type="checkbox"/>	

LEED

Green Building: Design & Construction

Credit Category	Points
Sustainable Sites	10
Water Efficiency	10
Energy & Atmosphere	35 *
Materials & Resources	14
Indoor Environmental Quality	15
Innovation & Design Process	9
Regional Priority	6
Total	110

LEED

Sustainable Sites (SS)

- Alternative Commuting
 - Public transportation, carpooling, alternative fuel vehicles, telework, bicycle racks & showers
- Heat Island Reduction
 - Reflective roof, green roof



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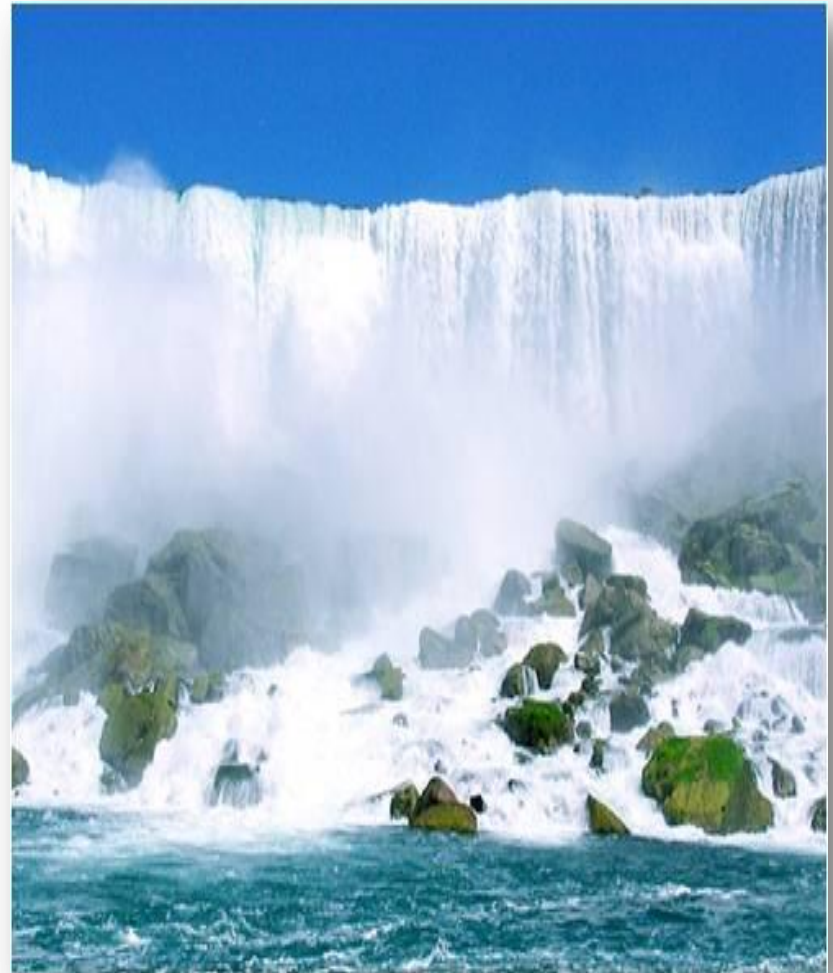
Sustainable Sites (SS)

- Stormwater Management
 - Increased Infiltration
- Light Pollution Management
 - > 50 watt shielded from night sky



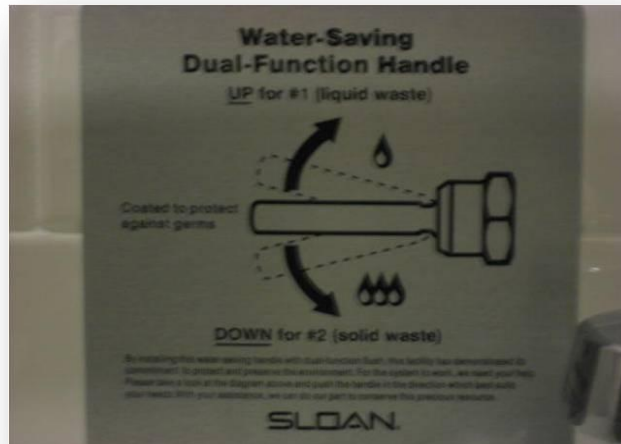
Water Efficiency (WE)

- Minimum water efficiency
 - 120% of baseline assuming all fixtures are Uniform Plumbing Code 2006
- Water efficient landscaping
 - Reduce potable water use
- Metering & sub-metering
- Cooling tower water management
 - Chemical management, non-potable water source use



Water Efficiency (WE)

- Installation of low flow bathroom fixtures: toilets, urinals, sinks, low flush urinals, dual flush toilets



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Water Efficiency (WE)

- Rainwater collection systems (e.g. cisterns)
- Grey water collection systems



LEED

Energy & Atmosphere (EA)

- Minimum energy
- Renewable energy
 - Solar, wind, hydroelectric
 - Onsite and offsite
- Ozone protection: No CFCs
- Refrigerant management:
No HCFCs
- Building commissioning



LEED

Material & Resources (MR)

- Sustainable purchasing policy
 - Alternative materials (salvaged, recycled, renewable-bamboo, cork)
 - Indoor air quality compliant products (low VOC carpets, paints, furniture)
 - Reduced mercury in lamps 90 pcg/lumen-hr, 70 pcg/lumen hr
- Solid waste management policy
 - Waste stream audit
 - Recycling



Indoor Environmental Quality (IEQ)

- Outdoor air & exhaust
 - Complies with ASHARE 62.1-2007
- Environmental tobacco smoke control
- Green cleaning policy
- IAQ Best Management Practices
 - Outdoor air delivery monitoring
 - Increased ventilation 30% better than 62.1
 - Reduced particulates in air distribution
 - IAQ Management for Facility Alterations & Additions
- Occupant comfort
 - Thermal comfort Monitoring
 - Daylight & views

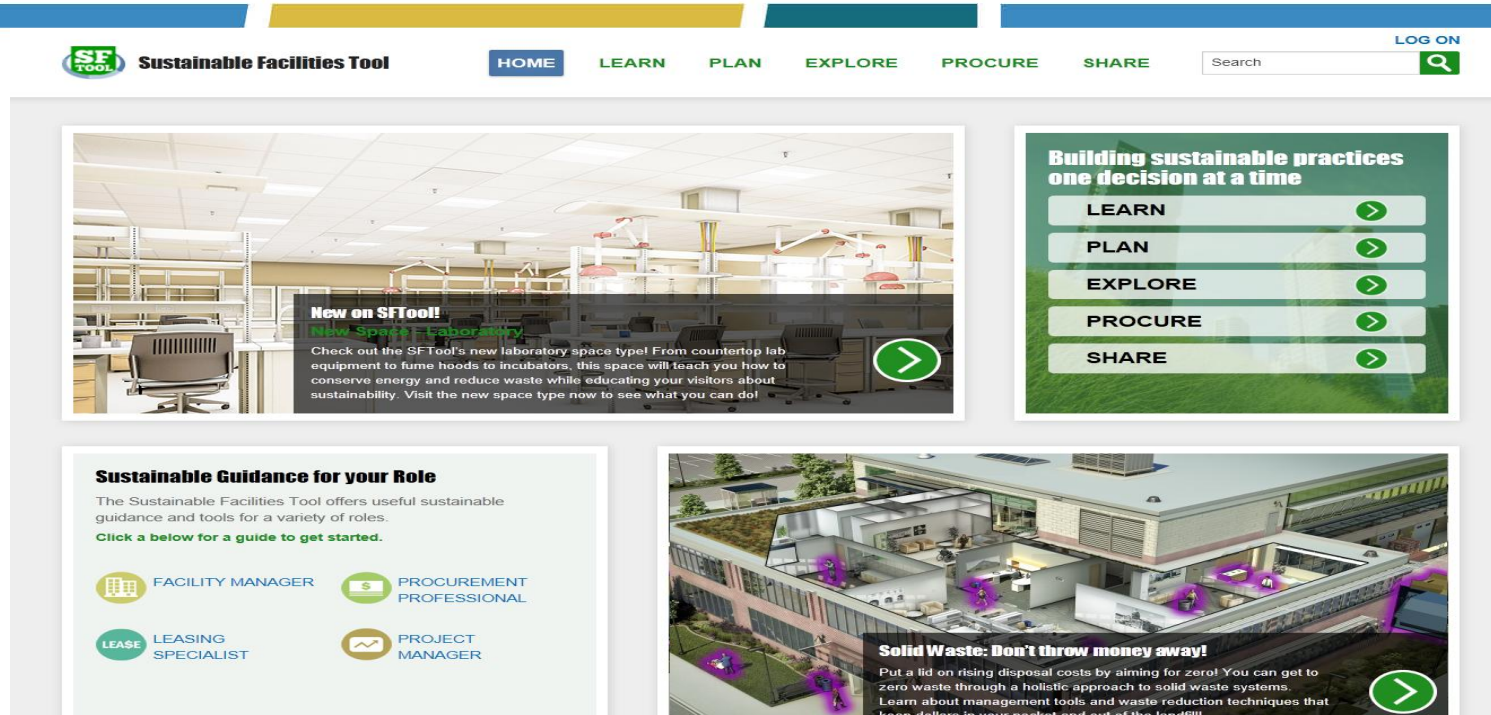


LEED & GSA

- All new construction required to be LEED Gold
- All lease construction projects required to be LEED Silver
- If pursuing, LEED Commercial Interiors (CI) to be LEED Silver
- Green Building Certification Review

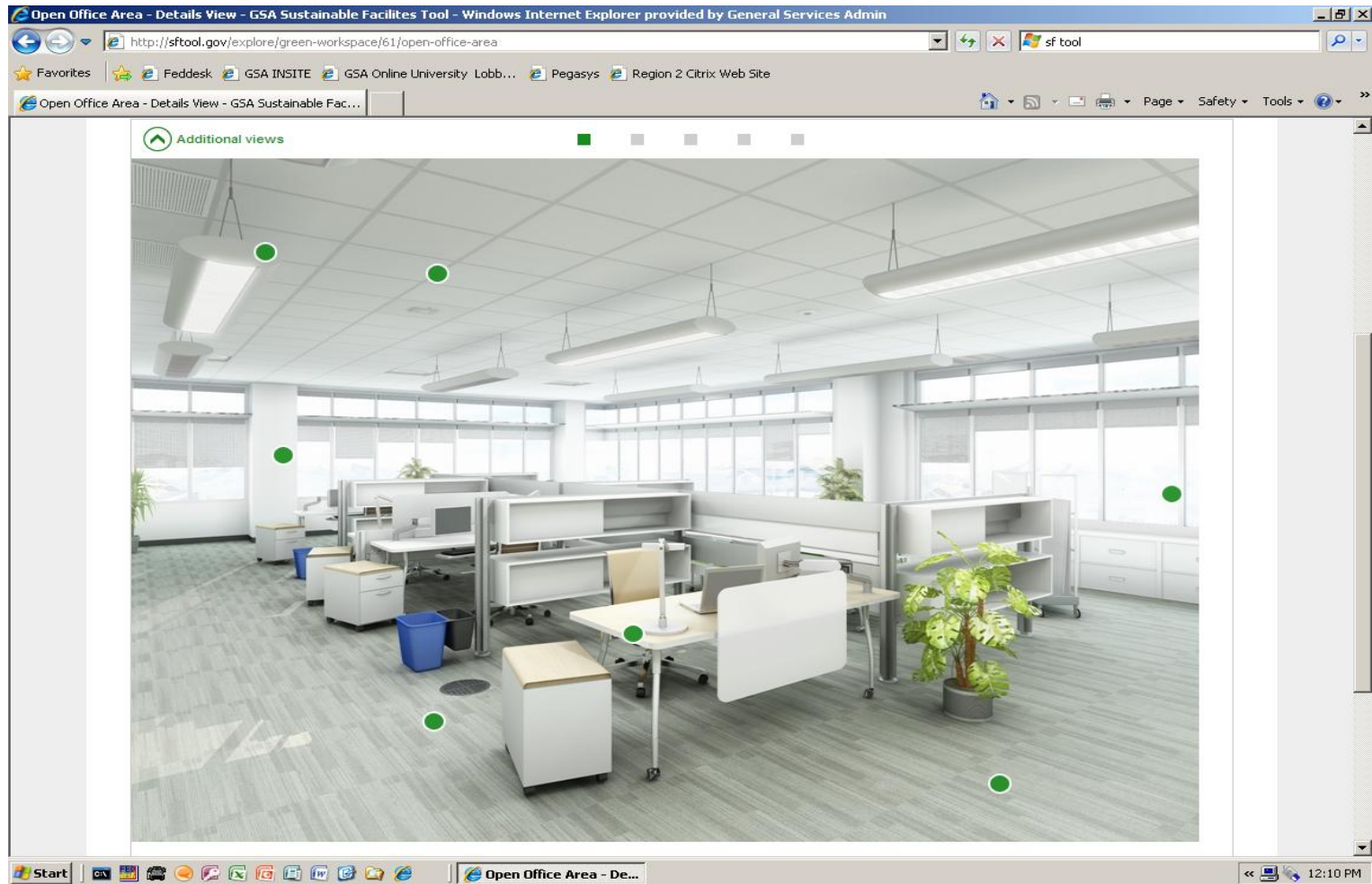


GSA Sustainable Facilities Tool



- Green Product Compilation on GSA's Sustainable Facilities WebTool
- Interactive Walk through tool
- **SFTool:** www.SFtool.gov

SFTool.gov



Thank You



Questions?

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Thank you for joining us today for a discussion on **Introduction to Sustainability**

- **Future sessions**

- February 27, 2014: Total Workplace
- March 20, 2014: Requirements Development

<http://www.gsa.gov/portal/content/142959>

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